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Evaluation of New Canal Point Sugarcane Clones

1995–96 Harvest Season

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ABSTRACT

Glaz, B., J.D. Miller, C.W. Deren, P.Y.P. Tai, J.C. Comstock, J.M. Shine, Jr., and O. Sosa, Jr. 1997. Evaluation of New Canal Point Sugarcane Clones: 1995–96 Harvest Season. U.S. Department of Agriculture, Agricultural Research Service, ARS–140, 26 pp.

Twenty-seven replicated experiments were conducted at 10 locations (representing 7 soils —Dania, Lauderhill, Pahokee, Terra Ceia, and Torry mucks, and Pompano fine sand and Malabar sand) to evaluate 29 new Canal Point (CP) clones of sugarcane (10 in the CP 91 series, 10 in the 90 CP series, and 9 in the CP 89 series). These experiments compared the cane and sugar yields of the new clones, complex hybrids of *Saccharum* spp., with yields of CP 70–1133, a widely grown commercial cultivar in Florida. Each clone was rated for its susceptibility to diseases.

CP 91–1914 yielded significantly more metric tons of sugar per hectare than CP 70–1133 in the CP 91 series when averaged across seven plant-cane experiments. No clone's mean TS/H yields were significantly greater than the TS/H of CP 70–1133 in the three plant-cane experiments of the CP 90 series, although CP 90–1510 was identified as a high-yielding clone on Malabar sand. CP 89–1325, CP 89–1717, CP 89–2143, and CP 89–2376 yielded significantly more TS/H than CP 70–1133 in the first- and second-ratoon experiments of the CP 89 series on organic soils.

Keywords: Histosol, muck soil, organic soil, *Puccinia melanocephala*, *Saccharum* spp., stability-safety index, sugarcane cultivars, sugarcane rust, sugarcane smut, sugarcane yields, sugar yields, *Ustilago scitaminea*.

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EVALUATION OF NEW CANAL POINT SUGARCANE CLONES

1995–96 Harvest Season

B. Glaz, J.D. Miller, C.W. Deren, P.Y.P. Tai, J.C. Comstock, J.M. Shine, Jr., and O. Sosa, Jr.

Clonal selection at precommercial stages is one of the major components in the successful commercial production of sugarcane, complex hybrids of *Saccharum* spp. Although production of sugar per unit area is a very important characteristic, it is not the only factor on which sugarcane is evaluated. In addition, analyses are made on the quantity of cane needed to produce a particular sugar yield and on the fiber content of the cane. The time of year and the duration that a clone yields its highest amount of sugar per unit area can be very important, since sugarcane harvest seasons extend from fall to spring. Because sugarcane is commercially grown in plant and ratoon crops, clones are evaluated accordingly. Florida growers have recently made a large-scale change from manual to mechanical harvesting. Therefore, clonal adaptability to mechanical harvesting is a trait that has recently gained in importance in Florida.

Information about the stability of a clone's performance across environments aids in selecting clones that will yield well across all environments. Stability measurements also enable identification of clones that will perform well in some, but not all, environments. This stability factor is important in our evaluations because of the wide range of environments for growing sugarcane in Florida. As differences in such characteristics as temperature, moisture, and soil widen, more location-specific clones become necessary because few clones produce high yields in markedly different environments.

Clones with desired agronomic characteristics must also be productive in the presence of harmful diseases, insects, and weeds. Some pests rapidly develop new, virulent races or strains. Clonal resistance to such pathogens often changes over time, so we cannot regard any clone as permanently resistant. The selection team must try not to discard clones that have sufficient resistance or tolerance to pests, but it also must discard clones that are too susceptible to pests to be grown commercially. Glaz et al. (1986) presented a formula and procedure to help growers distribute their available sugarcane cultivars while considering possible attacks of new pests.

The disease that has caused the most difficulty in selecting resistant cultivars has been sugarcane rust, caused by *Puccinia melanocephala* Syd and P. Syd. Florida sugarcane growers and scientists have had the most success in selecting resistant cultivars against sugarcane smut, caused by *Ustilago scitaminea* Syd and P. Syd. Florida sugarcane growers added leaf scald, caused by *Xanthomonas albilineans* (Ashby) Dow, to their list of major sugarcane diseases several years ago. Until recently, scientists did not know if yellow leaf syndrome was caused by a disease. The list needs to be updated because Lockhart et al. (1996) reported that yellow leaf syndrome is caused by a luteovirus. Sugarcane mosaic virus must be added to the list at least temporarily, as several infected commercial fields of CP 72–2086 were found recently. CP 72–2086 comprised 15.5 percent of Florida's sugarcane crop in 1995 (Glaz 1995). Ratoon stunt disease (RSD), caused by *Clavibacter xyli* subsp. *xyli*, has probably been the most damaging, although the least visible, sugarcane disease in Florida. Scientists at Canal Point screen clones for resistance to rust, smut, leaf scald, mosaic, RSD, and eye spot, caused by *Bipolaris sacchari*. Eye spot is currently not a problem in Florida.

The most damaging insect pests in Florida of long duration are the sugarcane borer, *Diatraea saccharalis* (F.); the sugarcane wireworm, *Melanotus communis*; and the sugarcane grub, *Ligyrus subtropicus*. An insect discovered in Florida in 1990, the sugarcane lace bug, *Leptodictya tabida*, has also become a pest, selectively feeding upon some clones (Hall 1991). In 1994, another insect pest new to commercial sugarcane fields in Florida was found—the West Indian cane weevil,

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Metamasius hemipterus (L.) (Sosa 1995). In 1994, that sugarcane weevil caused particularly severe damage to several plantings of CP 85–1382, a promising new clone described previously in this series of reports. Scientists at Canal Point are working to incorporate borer resistance into this breeding program by selecting for leaf pubescence in elite sugarcane clones (Sosa 1996). Currently, there are no known commercial sugarcane cultivars with pubescent leaves.

Each year at Canal Point, we evaluate approximately 100,000 seedlings from crosses derived from a diverse germplasm collection, although perhaps not a sufficiently diverse cytoplasmic base (Mangelsdorf 1983). This year, most of the parental clones in our program originated from Canal Point. In addition, clones used as parents this season came from Clewiston, Florida, Louisiana, and Texas, and from Argentina, Australia, Brazil, New Guinea, South Africa, Taiwan, and Vietnam. Also, we used several feral *Saccharum officinarum* and *Saccharum robustum* clones and interspecific hybrids of these clones as parents.

We select about 1 percent of 100,000 seedlings, from the seedling and stage I phases of our program, over a 2-year period at Canal Point. The first year, we visually select about 10 percent, or 10,000 of the available seedlings, and vegetatively or clonally propagate them. From this stage on in the selection program, all reproduction is vegetative, hence, the use of genetically identical clones, assuming no mutations or the unlikely formation of true seeds that would germinate naturally in our plots. The second year, we visually select about 10 percent of these 10,000 clones. From these 1,000 selected clones in stage II, we select 131 for continued testing in replicated experiments for 2 years at 4 locations in stage III. The primary selection criteria for the groups of 1,000 and 131 clones are disease resistance, cane tonnage, and sugar yields.

The 10 or 11 most promising clones receive continued testing for 3 more years in the stage IV experiments. Tai and Miller (1989) described this selection program from the seedling to the stage IV phase in more detail. Clones that successfully complete these experimental phases undergo 2 to 4 years of evaluation and seed-cane increase by the Florida Sugar Cane League before commercial release. Some of this evaluation occurs concurrently with the evaluations described herein.

Clones with characteristics that may be valuable for sugarcane breeding programs are identified throughout the selection process. Sugarcane geneticists in other programs often request clones from Canal Point. From May 1995 to April 1996, Canal Point (CP) clones or seeds were requested from and sent to Bangladesh, Egypt, El Salvador, France, Nicaragua, Panama, and Taiwan. Alabama, Delaware, Georgia, Maryland, Ohio, Pennsylvania, Texas, and seven other locations in Florida also received CP clones.

Test Procedures

In 27 experiments, 29 new CP clones (10 clones of the CP 91 series in the plant crop, 10 clones of the CP 90 series in the plant and first-ratoon crops, and 9 clones of the CP 89 series in the first- and second-ratoon crops) were evaluated at 10 farms. Two additional new clones—CP 91–2246 at six farms and CP 91–1609 at one farm—were tested in the plant-cane experiments with the CP 91 clones. Two additional new clones were also tested in the plant-cane and first-ratoon experiments with the CP 90 clones—CP 90–1428 at eight farms on organic soils and CP 90–1030 at two farms on sand soils. CP 89–1268 and CP 89–1756 were included in nine ratoon experiments of the CP 89 series, and CP 89–1509 was included in one second-ratoon experiment on a sand soil.

CP 70–1133, the fifth most widely grown sugarcane cultivar in Florida in 1995, was the primary reference clone in all 27 experiments (Glaz 1995). CP 73–1547, the fourth most widely grown clone in Florida, was a secondary reference clone in one second-ratoon experiment (Glaz 1995).

The plant-cane experiment at A. Duda and Sons', Inc. (Duda), southeast of Belle Glade, and the first-ratoon experiment at Knight Management, Inc. (Knight), southwest of 20-Mile Bend, were conducted on Dania muck soils. As described by McCollum et al. (1976), Dania is the shallowest of the organic soils in south Florida consisting primarily of decomposed sawgrass (*Cladium jamaicense*

Crantz). The other organic soils similar to Dania muck, listed in order of increasing depth, are Lauderhill, Pahokee, and Terra Ceia mucks.

Ten experiments were conducted on Lauderhill mucks—all five experiments planted at Okeelanta Corporation (Okeelanta) south of South Bay, all three experiments planted at Wedgworth Farms, Inc. (Wedgworth), the first-ratoon experiment at New Hope Sugar Company (New Hope) east of Canal Point, and the second-ratoon experiment at Knight.

Six experiments were conducted on Pahokee mucks. These included the plant-cane experiments at Knight and New Hope and both ratoon experiments at Duda and South Florida Industries near 20-Mile Bend in Palm Beach County. Two experiments were conducted on Terra Ceia mucks—the plant-cane experiment at South Florida Industries and the second-ratoon experiment at New Hope. The two experiments at Eastgate Farms, Inc. (Eastgate) north of Belle Glade were on Torry muck, the three experiments at Hilliard Brothers' of Florida Ltd. (Hilliard) west of Clewiston were on Malabar sand, and the three experiments at Lykes Brothers' Farm (Lykes) near Moore Haven in Glades County were on Pompano fine sand.

The plant-cane and first-ratoon experiments at Lykes and the CP 90 plant-cane and the CP 89 first-ratoon experiments at Okeelanta were planted on fields in successive sugarcane rotations. The other experiments were planted in fields that had been fallow for several months. In all ratoon experiments, clones were planted with two lines of seed cane per furrow in plots arranged in randomized complete-block designs with four replications. Each plot was 10.7 m long and 6 m wide (0.0065 ha), except in the first-ratoon experiment at Lykes, where plots were 9.7 m long and 6 m wide. In the plant-cane experiments, plots were also arranged as randomized complete blocks, but plots were 10.7 m long and 3 m wide, and there were 8, rather than 4 replications. For all experiments, the distance between rows was 1.5 m, and 1.5-m alleys separated the front and back ends of the plots. The margins of the experiments were protected with an extra row of sugarcane on each side and an extra 1.5 m of sugarcane in the front and back. Outside rows of most plots were bordered by one row of the same clone as planted in the plot.

Before reaching this stage of selection, clones were tested by artificial inoculation for susceptibility to sugarcane mosaic virus and eye spot. Each clone was rated for its reaction to sugarcane smut, sugarcane rust, and leaf scald by natural infection at the experimental sites. In addition, each clone was artificially inoculated with pathogens of smut, ratoon stunt, and leaf scald diseases and later rated for susceptibility in separate experiments. The farm management at each location controlled sugarcane management practices, such as fertilization, cultivation, and pest control.

Samples of 10 stalks per plot were cut from unburned cane from all plots in each experiment between October 12, 1995 and March 5, 1996. From the ratoon experiments, two samples per plot were obtained—one sample was cut from an outside plot row and the other, from an inside plot row. From the plant-cane experiments, one sample per plot was cut from the middle row of each plot. In addition, a preharvest sample was cut from two replications of eight plant-cane experiments between October 18, 1996 and October 26, 1996. For all samples, once a stool of sugarcane was chosen for cutting, the next 10 stalks in the row were cut as the 10-stalk sample. The range of sample dates for each crop was as follows: November 30, 1995 to March 5, 1996, for the plant crop; November 13, 1995 to January 4, 1996, for the first-ratoon crop; and October 12, 1995 to January 21, 1996, for the second-ratoon crop. Crusher juice samples from the stalks were analyzed for Brix and sucrose, and theoretical recoverable yields of kg 96° sugar per metric ton of cane (KS/T) were determined as a measure of sugar production after the stalk samples were transported to the Agricultural Research Service's laboratory at Canal Point for weighing and milling. An explanation of the procedure used to calculate these yields using fiber percentages is in Legendre (1992).

Total millable stalks per plot were counted between June 12, 1995, and October 3, 1995. Yields of metric tons of cane per hectare (TC/H) were calculated by multiplying stalk weights by the number of stalks. Theoretical yields of metric tons of sugar per hectare (TS/H) were calculated by multiplying TC/H by KS/T and dividing by 1,000.

Analyses of variance were done using the procedures described by McIntosh (1983). *F*-ratios were chosen according to a mixed model, with fixed treatments (clones) and random locations. The source of variation that corresponded to the error term for the effect being tested was used to calculate the least significant difference (*LSD*). *LSD* was used, regardless of significance of *F*-ratios in all analyses, to protect against high type-II error rates. Significant differences were sought at the 10-percent probability level (Glaz and Dean 1988).

Analyses of clonal stability across locations were done by using the procedures recommended in Shukla (1972). For each clone, the stability-variance parameter of Shukla was subsequently used to calculate (at the 1-percent probability level) a stability-safety index, as described by Eskridge (1990). The mean yield of the clone and the stability of the clone across locations influence the value of this stability-safety index. The higher the stability-safety index, the more likely the clone is to have high yields at all locations.

Results and Discussion

Table 1 lists the parentage, percent fiber, and reactions to smut, rust, and leaf scald diseases for each clone included in these experiments. Tables 2–5 contain the results of the CP 91 plant-cane experiments, and tables 6 and 7 contain the results of this year's CP 90 plant-cane experiments. Tables 8–10 contain the results of the CP 90 first-ratoon experiments and table 11 contains the results of the CP 89 first-ratoon experiment. Tables 12–15 contain the results of the CP 89 second-ratoon experiments. Table 16 lists the dates that stalks were counted in each experiment.

Plant-cane crop, CP 91 series

One new clone, CP 91–1914, when averaged across all seven locations, yielded significantly more TC/H, KS/T, and TS/H than CP 70–1133 (tables 2,4, and 5). The only category in which CP 91–1914 did not excel was preharvest KS/T (table 3). CP 91–1914 yielded significantly more TS/H than CP 70–1133 at each farm with organic soil except Duda, and at Duda, CP 91–1914 had the highest TS/H yield, although it was not significantly higher than several clones. On the sand soil at Lykes, the yields of CP 91–1914 were mediocre.

No clone except CP 91–1914 had significantly different TS/H from CP 70–1133 (table 5). However, CP 91–1924 and CP 91–2246 are promising due to their high preharvest and harvest KS/T yields (tables 3 and 4).

In the experiment at Lykes, on a sand soil, CP 91–1150 yielded significantly more TS/H than CP 70–1133 (table 5). This high TS/H yield was due to a high TC/H yield (table 2) and a moderate KS/T yield (table 4). CP 91–1150 had low yields in many of the experiments on organic soils.

The fiber percentages of CP 91–1914, CP 91–1924, CP 91–2246, and CP 91–1150 are well within the normal commercial range for Florida. CP 91–1914 is resistant to smut and leaf scald, but its intermediate rust rating is due to heavy levels of rust at several locations. CP 91–2246 has shown borderline susceptibilities to rust and leaf scald. The only disease concern with CP 91–1150 is its moderate susceptibility to leaf scald. CP 91–1924 has so far shown resistance to the major sugarcane diseases in Florida. Two of the most promising clones from the CP 91 series—CP 91–1150 and CP 91–1914—came from polycrosses with CP 80–1827 as the female parent (table 1). CP 80–1827 is the most widely grown sugarcane cultivar in Florida (Glaz 1995).

Plant-cane crop, CP 90 series

Last year's report contained the results from seven locations of the CP 90 series from the plant-cane crop (Glaz et al. 1995). This year, the results are available from three additional plant-cane experiments with these clones (tables 6 and 7).

When averaged across all three locations, no clone yielded significantly more TS/H than CP 70–1133 (table 7). However, at least one new clone had high yields at each of the three locations. At the Okeelanta experiment, which was successively planted on an organic soil, CP 90–1428 yielded significantly more TC/H and TS/H than CP 70–1133 (table 7). CP 90–1428 did not have outstanding KS/T yields at either of the two locations where it was planted (table 6). CP 90–1428 also had

unstable plant-cane yields last year (Glaz et al. 1995).

On the Torry muck at Eastgate, three new clones—CP 90–1464, CP 90–1436, and CP 90–1535—yielded significantly more TS/H than CP 70–1133 (table 7). Both CP 90–1436 and CP 90–1535 yielded significantly more TS/H than CP 90–1464. All three of these new clones had high KS/T yields at all three locations (table 6). The TS/H yields of CP 90–1464 were unstable last year also (Glaz et al. 1995). CP 90–1436 had moderate to low yields last year, except at Knight, where its TC/H and TS/H yields were outstanding (Glaz et al. 1995). CP 90–1535 was one of the most promising new clones last year, based primarily on its high KS/T yields (Glaz et al. 1995). This year, it had high KS/T, TC/H, and TS/H yields in this early planted experiment at Eastgate (tables 6 and 7).

Five new clones yielded significantly more TS/H than CP 70–1133 did on the Malabar sand at Hilliard. However, the outstanding clone in the group was CP 90–1510 because it yielded significantly more TS/H than any other clone in that experiment (table 7). The high TS/H yield of CP 90–1510 was due mostly to its high TC/H yield (table 7), rather than its mediocre harvest or preharvest KS/T yields (table 6). CP 90–1510 did not have as high yields as plant cane last year on organic or sand soils (Glaz et al. 1995).

First-ratoon crop, CP 90 series

When averaged across all seven locations, CP 90-1436 was the only clone in the first-ratoon crop that yielded significantly more TS/H than CP 70–1133 (table 10). It also yielded significantly more TS/H than any other clone in the group, except CP 90–1204, and significantly more TC/H (table 8) and KS/T (table 9) than CP 70–1133. The TS/H yields of CP 90–1436 were also the most stable in this group, due to its consistently high yields at all locations. As mentioned previously, CP 90–1436 did not have high plant-cane yields last year (Glaz et al. 1995).

Based on their combined plant-cane and first-ratoon yields, two other clones in this group, CP 90–1464 and CP 90–1535, had TS/H yields not significantly different from the TS/H yield of CP 70–1133 (table 10). However, the TS/H yield of CP 90–1464 was significantly greater than that of CP 90–1535. The high TS/H yields of CP 90–1464 at several locations were due more to its high TC/H yields (table 8) than its consistently low KS/T yields (table 9). CP 90–1464 had unstable TC/H and TS/H yields (tables 8 and 10).

CP 90–1535 also had unstable TS/H yields, due to its low yields at some locations and moderate yields at others (table 10). Unlike CP 90–1464, the TC/H yield of CP 90–1535 was low (table 8), but its KS/T yield was significantly greater than that of any other clone, except CP 90–1113 (table 9).

All of the clones discussed in the CP 90 series, whether as plant cane or first ratoon, had acceptable fiber levels. The most serious disease concern among these clones is the rust susceptibility of CP 90–1436. CP 90–1428, CP 90–1464, and CP 90–1510 have all had low levels of rust and intermediate susceptibility to leaf scald (table 1).

First-ratoon crop, CP 89 series

Eight clones in this group yielded significantly more TS/H than CP 70–1133 (table 11). Last year, the two outstanding clones in this group were CP 89–2143 and CP 89–2376 (Glaz et al. 1995). CP 89–2143 was the outstanding clone in this test; it yielded significantly more TS/H than all other clones, except CP 89–2377 and CP 89–1717. CP 89–2143 also yielded significantly more TC/H and KS/T than CP 70–1133 (table 11). CP 89–2377 yielded significantly more TS/H than eight other clones, and more TC/H than all other clones, except CP 89–2143, but its KS/T yield was among the lowest in the group (table 11).

Second-ratoon crop, CP 89 series

Results from these clones were grouped by soil. Tables 12–14 report yields from organic soils, and table 15 reports yields from sand soils. The outstanding clones were similar on each soil, except for the reference clone CP 70–1133, which was among the highest yielding clones at the locations with sand soils.

For TS/H yields averaged across all locations, CP 89–2143 was the highest ranking clone on organic and sand soils (tables 14 and 15). Its mean KS/T

yield on both soils was significantly greater than that of CP 70–1133 (tables 13 and 15). CP 89–2143 also yielded significantly more TS/H and TC/H than several other clones, including CP 70–1133, on the organic soils. Based on its actual ranks for TC/H and TS/H, CP 89–2143 had relatively low stability-safety indices for these characteristics on the organic soils (tables 12 and 14). Careful attention to the TC/H and TS/H yields of CP 89–2143 shows that it did very well at most locations, except South Florida Industries and New Hope, where it had moderately high yields, and Eastgate, where it had low yields. CP 89–2143 had consistently high KS/T yields at individual locations (tables 13 and 15). As plant cane, CP 89–2143 had high TS/H and TC/H yields, but low KS/T yields (Glaz et al. 1994). These low KS/T yields are surprising in retrospect, based on its high KS/T yields this year as both first and second ratoons (tables 11, 13, and 15), and its high KS/T yields last year as both plant cane and first ratoon (Glaz et al. 1995).

CP 89–1717, CP 89–1325, and CP 89–2376, yielded significantly more TS/H than CP 70–1133 on organic soils and were among the highest ranking clones for TS/H on sand soils (tables 14 and 15). CP 89–1717 and CP 89–1325 had the two most stable TS/H yields on organic soils, and CP 89–2376 had one of the least stable (table 14). Although these three new clones were not significantly different from each other for any yield characteristic on sand, both CP 89–2376 and CP 89–1325 appeared superior to CP 89–1717 in TC/H and TS/H (table 15). Of these three clones, CP 89–2376 had the most consistently high TS/H yields in plant cane (Glaz et al. 1994) and first ratoon (Glaz et al. 1995). However, in addition to CP 89–2376, both CP 89–1717 and CP 89–1325 had high 3-year average TS/H yields (data not shown).

CP 89–2377 and CP 89–1331 for all soils and CP 89–1509 for the Malabar sand soil had high yields in previous years (Glaz et al. 1994 and 1995). This year, CP 89–2377 and CP 89–1331 had respectable, but not high, TS/H yields on the organic soils, and CP 89–2377 had respectable, but not high, TS/H yields on the sand soils, whereas CP 89–1331 had low TS/H yields on the sand soils (tables 14 and 15). CP 89–1509 had low yields on the Malabar sand at Hilliard (table 15).

All of the clones discussed in the CP 89 series—CP 89–1325, CP 89–1331, CP 89–1509, CP 89–1717, CP 89–2143, CP 89–2376, and CP 89–2377—whether as first or second ratoon, had acceptable fiber levels and were resistant to smut. Only CP 89–1509 was resistant to both rust and leaf scald. CP 89–1325 was resistant to rust but had low levels of leaf scald. CP 89–1717, CP 89–2143, CP 89–2376, and CP 89–2377 all had low levels of rust infection and intermediate levels of leaf scald infection. CP 89–1331 had intermediate levels of rust and leaf scald infections (table 1).

SUMMARY

CP 91–1914 was the only clone in the CP 91 plant-cane experiments that yielded significantly more TS/H than CP 70–1133. CP 91–1914 had its high yields on farms with organic soils. At the location with a sand soil, CP 91–1150 had high yields.

This year, the CP 90 series was tested at three locations as plant cane and at seven locations as first ratoon. CP 90–1464 was the only clone identified, without serious disease concerns, with high overall TS/H yields, by combining this year's results with last year's plant-cane results from seven locations. CP 90–1535 had moderately high TS/H yields for all CP 90 combined data. Its high KS/T yields will make it a profitable commercial clone only if it can maintain its moderate TS/H yields through the second-ratoon crop. CP 90–1510 yielded well on Malabar sand at one location in plant cane this year. It had not been tested at that location before.

This year, the CP 89 series was tested at one location as first ratoon and at seven locations as second ratoon. The eight second-ratoon locations were previously analyzed as plant cane and first ratoon, and the first-ratoon experiment was previously analyzed as plant cane. Combined results of all these experiments identify CP 89–2143 as the highest TS/H-yielding clone in this group, and due to its high KS/T yields, as the most profitable. Other high-yielding clones of general adaptation were CP 89–1325, CP 89–1717, CP 89–2376, and CP 89–2377. CP 89–1509 was only tested at the location with Malabar sand, where it had low TS/H yields.

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Table 1. Parentage, fiber content, and ratings for susceptibility to smut, rust, and leaf scald of CP 70–1133, CP 72–1210, CP 73–1547, and 36 new sugarcane clones

Clone	Parentage	Percent fiber	Rating*		
			Smut	Rust	Leaf scald
CP 70–1133	67 P 6 CP 56–63†	10.37	R	I	L
CP 72–1210	CP 65–357 x CP 56–63	10.04	R	S	I
CP 73–1547	CP 66–1043 x CP 56–63	9.44	L	I	R
CP 89–1268‡	CP 78 2114 x CP 78–1610	10.12	R	L	I
CP 89–1325	CP 80–1557 x CP 72–1210	10.40	R	R	L
CP 89–1331	CP 81–1238 x CP 72–2086	9.43	R	I	I
CP 89–1509‡	86 P 19 CP 80–1827†	10.16	R	R	R
CP 89–1632	CP 73–1547 x CP 81–1254	9.62	R	I	L
CP 89–1643	CP 73–1547 x CP 81–1254	10.01	R	I	I
CP 89–1717	CP 81–2149 x CP 81–1238	9.13	R	L	I
CP 89–1756‡	86 P 30 CP 81–2149†	9.58	R	I	I
CP 89–1945	CP 72–2086 x CP 78–1610	10.03	R	R	I
CP 89–2143‡	CP 81–1254 x CP 72–2086	9.85	R	L	I
CP 89–2376‡	Unknown	10.19	R	L	I
CP 89–2377‡	Unknown	8.93	L	L	I
CP 90–1030	CP 76–331 x CP 81–1425	10.40	R	R	L
CP 90–1113	87 P 4 CP 80–1827	9.85	R	I	S
CP 90–1151	87 P 4 CP 78–1247	10.45	R	I	L
CP 90–1204	CP 82–2043 x CP 70–1133	10.90	R	I	I
CP 90–1222	87 P 9 CP 78–1247	11.09	R	I	I
CP 90–1424	CP 78–1610 x CP 80–1827	10.96	R	I	R
CP 90–1428	CP 78–1610 x CP 80–1827	10.32	R	L	I
CP 90–1436	CP 81–332 x CP 78–1610	10.71	R	S	I
CP 90–1464	CP 81–1435 x CP 72–2086	10.57	R	L	I
CP 90–1510	CP 83–1770 x CP 83–1281	11.08	L	L	I
CP 90–1535	88 P 7 CP 81–1425	9.91	R	R	L
CP 90–1549	CP 82–1592 x CP 84–1322	11.91	R	R	R
CP 91–1062	88 P 9 CP 83–1281	9.66	L	L	R
CP 91–1150	88 P 7 CP 80–1827	10.18	L	L	I
CP 91–1238	88 P 7 CP 70–1133	8.79	R	S	R
CP 91–1560	CP 86–1791 x CP 82–2043	9.98	R	L	R
CP 91–1609	CP 83–1770 x CP 82–1505	9.83	R	R	R
CP 91–1865	88 P 17 CP 81–1425	10.50	R	S	I
CP 91–1880	CP 82–2043 x CP 84–1322	10.57	R	L	R
CP 91–1883	CP 80–1827 x CP 84–1322	9.99	R	L	L
CP 91–1914	88 P 17 CP 80–1827	9.88	R	I	R
CP 91–1924	CP 86–1791 x CP 81–2149	9.66	R	L	L
CP 91–1980	CP 62–374 x CP 84–1322	9.96	R	L	L
CP 91–2246	CP 77–1776 x CP 56–59	10.83	R	I	I

**R* = resistant enough for commercial production; *L* = low levels of disease susceptibility; *S* = too susceptible for production; *I* = intermediate susceptibility (available data not sufficiently persuasive to determine susceptibility).

†67 P 6 = 6th polycross made in 1967 crossing season. Female parent (CP 56–63) exposed to pollen from many clones; therefore, male parent of CP 70–1133 unknown. Similar explanations for CP 89–1509, CP 89–1756, CP 90–1113, CP 90–1151, CP 90–1222, CP 90–1535, CP 91–1062, CP 91–1150, CP–1238, CP 91–1865, and CP 91–1914.

‡Seed cane currently being increased by Florida Sugar Cane League, Inc., for potential release.

Table 2. Yields of cane (in metric tons per hectare—TC/H) from plant cane on Dania muck, Lauderhill muck, Pahokee muck, Terra Ceia muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Dania muck	Lauderhill muck		Pahokee muck		Terra Ceia muck	Pompano fine sand		
Clone	Duda 1/30/96	Okeelanta 1/30/96	Wedg-worth 2/14/96	New Hope 1/11/96	Knight 1/16/96	S. Fla. Ind. 1/8/96	Lykes Bros. 12/4/95	Stability-safety index*	Mean yield, all farms
CP 91–1914	112.20	189.12	210.16	140.42	122.16	129.51	58.79	–119.60	137.48
CP 91–1924	110.74	131.05	212.10	119.16	102.74	124.84	53.92	–154.29	122.08
CP 70–1133	109.51	174.42	162.79	128.18	92.31	118.21	54.78	–115.20	120.03
CP 91–1980	108.45	160.52	151.92	118.04	91.70	130.27	65.28	–114.71	118.02
CP 91–1560	109.69	150.79	150.84	126.16	113.82	107.43	64.66	–121.16	117.63
CP 91–1883	103.68	153.92	182.30	124.14	91.87	105.22	49.61	–123.53	115.82
CP 91–1150	100.01	170.07	139.89	127.07	81.50	111.82	76.09	–134.70	115.21
CP 91–2246	99.19	156.65		130.51	109.49	119.00	60.46	–109.49	112.55
CP 91–1238	102.79	129.53	142.71	116.33	84.61	119.81	57.01	–128.68	107.54
CP 91–1880	94.46	142.48	126.89	121.77	81.55	119.62	59.93	–137.16	106.67
CP 91–1865	90.72	147.14	152.22	102.02	81.45	122.76	49.89	–125.44	106.60
CP 91–1062	87.43	126.36	144.10	104.84	87.59	116.41	69.80	–136.49	105.22
CP 91–1609			169.10						
Mean	102.40	152.67	162.08	121.55	95.06	118.74	60.02	–126.71	115.40
LSD(p=0.1)†	11.80	8.98	17.77	13.34	19.08	18.06	11.62		11.61
CV(%)‡	13.81	13.11	13.13	13.14	24.03	18.21	23.19		16.16

*Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-safety-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

†*LSD* for location means = 8.51 t/ha at $p = 0.10$.

‡*CV* = coefficient of variation.

Table 3. Preharvest theoretical recoverable yields of 96° sugar (in kilograms per metric ton of cane—KS/T) from plant cane on Dania muck, Lauderhill muck, Pahokee muck, Terra Ceia muck, and Pompano fine sand

Clone	Mean yield by soil type, farm, and sampling date: Dania muck	Lauderhill muck		Pahokee muck	Pompano fine sand	Stability-safety index*	Mean yield, all farms
	Duda 10/23/95	Wedgworth 10/18/95	Okeelanta 10/26/95	Knight 10/23/95	Lykes 10/24/95		
CP 91–1883	104.9	101.0	116.6	95.9	146.8	59.6	113.0
CP 91–1924	113.1	111.0	125.0	83.5	131.6	53.5	112.8
CP 91–2246	108.7		118.9	87.3	130.0	54.9	111.2
CP 91–1560	106.1	105.5	118.5	100.8	117.9	55.1	109.8
CP 91–1865	100.2	97.2	108.8	99.4	134.0	57.4	107.9
CP 91–1238	96.5	88.8	109.1	91.4	136.3	52.6	104.4
CP 91–1914	95.8	94.3	126.6	86.5	118.7	49.6	104.4
CP 91–1880	89.5	88.4	121.6	93.0	125.7	51.6	103.6
CP 91–1062	93.7	95.6	95.0	88.5	140.3	39.2	102.6
CP 91–1150	102.1	74.3	120.5	88.0	121.2	41.4	101.2
CP 91–1980	85.4	99.5	117.4	97.7	94.7	23.9	98.9
CP 70–1133	85.7	88.7	95.1	94.2	123.8	41.8	97.5
CP 91–1609		90.4					
Mean	98.4	94.5	114.4	92.2	126.7	48.4	105.6
LSD(p=0.1)†	19.5	25.1	13.8	17.3	33.8	—	10.2
CV(%)‡	11.0	12.2	8.1	10.4	14.8	—	12.2

*Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter.

†*LSD* for location means = 10.2 kg of sugar per metric ton of cane at $p = 0.10$.

‡*CV* = coefficient of variation.

Table 4. Theoretical recoverable yields of 96° sugar (in kilograms per metric ton of cane—KS/T) from plant cane on Dania muck, Lauderhill muck, Pahokee muck, Terra Ceia muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Dania muck	Lauderhill muck		Pahokee muck		Terra Ceia muck	Pompano fine sand		
Clone	Duda 1/30/96	Okeelanta 1/30/96	Wedg-worth 2/14/96	New Hope 1/11/96	Knight 1/16/96	S. Fla. Ind. 1/8/96	Lykes Bros. 12/4/95	Stability-safety index*	Mean yield, all farms
CP 91–2246	119.7	122.5		118.2	110.9	120.5	130.6	37.7	120.4
CP 91–1914	113.2	120.4	106.4	121.5	110.1	125.2	134.6	42.0	118.8
CP 91–1924	107.6	114.8	108.5	116.1	101.9	117.1	139.6	40.9	115.1
CP 91–1238	108.1	114.7	105.6	113.8	109.2	116.2	137.1	41.7	114.9
CP 91–1980	113.1	110.7	101.1	115.3	102.9	118.9	141.5	39.9	114.8
CP 91–1062	107.3	116.9	109.2	111.3	103.5	112.8	137.4	38.9	114.1
CP 91–1883	108.3	107.5	108.0	113.6	104.0	111.7	140.5	37.6	113.4
CP 91–1880	113.0	112.0	103.9	112.1	101.1	112.0	133.9	39.6	112.6
CP 91–1865	112.9	112.1	107.7	111.9	98.3	110.0	134.4	36.4	112.5
CP 91–1560	109.2	111.7	104.0	113.2	103.4	112.2	130.7	39.1	112.0
CP 70–1133	106.3	109.7	97.9	109.7	104.7	114.1	138.9	37.1	111.6
CP 91–1150	109.2	110.7	87.8	110.2	100.6	114.5	139.4	27.3	110.4
CP 91–1609			105.4						
Mean	110.7	113.6	103.8	113.9	104.2	115.4	136.5	38.2	114.2
LSD(p =0.1)†	3.8	6.0	3.6	5.4	6.4	5.9	6.1	—	3.3
CV(%)‡	4.1	6.4	4.2	5.7	7.4	6.1	5.4	—	5.7

*Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter.

†*LSD* for location means = 2.0 kg of sugar per metric ton of cane at $p = 0.10$.

‡*CV* = coefficient of variation.

Table 5. Theoretical recoverable yields of 96° sugar (in metric tons per hectare—TS/H) from plant cane on Dania muck, Lauderhill muck, Pahokee muck, Terra Ceia muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Dania muck	Lauderhill muck		Pahokee muck		Terra Ceia muck	Pompano fine sand		
Clone	Duda 1/30/96	Okeelanta 1/30/96	Wedg-worth 2/14/96	New Hope 1/11/96	Knight 1/16/96	S. Fla. Ind. 1/8/96	Lykes Bros. 12/4/95	Stability-safety index*	Mean yield, all farms
CP 91–1914	12.712	22.785	22.305	17.048	13.514	16.183	7.932	–10.602	16.068
CP 91–1924	11.911	15.056	22.963	13.815	10.466	14.467	7.545	–15.267	13.746
CP 91–2246	11.867	19.240		15.469	12.116	14.395	7.929	–8.806	13.503
CP 91–1980	12.277	17.745	15.296	13.618	9.446	15.526	9.236	–10.229	13.306
CP 70–1133	11.673	19.112	15.954	14.130	9.602	13.489	7.619	–9.865	13.083
CP 91–1560	12.000	16.896	15.693	14.300	11.774	12.055	8.570	–10.639	13.041
CP 91–1883	11.269	16.647	19.680	14.107	9.536	11.768	7.062	–11.738	12.867
CP 91–1150	10.967	18.941	12.314	14.027	8.231	12.794	10.595	–14.938	12.553
CP 91–1238	11.138	14.869	15.040	13.342	9.247	13.968	7.835	–10.971	12.206
CP 91–1062	9.365	14.776	15.654	11.679	9.102	13.044	9.575	–12.182	11.885
CP 91–1880	10.698	16.022	13.204	13.669	8.180	13.378	7.968	–11.966	11.874
CP 91–1865	10.262	16.523	16.345	11.404	8.068	13.445	6.716	–10.968	11.823
CP 91–1609			17.866						
Mean	11.345	17.384	16.860	13.884	9.940	13.709	8.215	–11.515	12.996
LSD(p =0.1)†	1.389	1.924	2.232	1.817	2.090	2.160	1.704		1.414
CV(%)‡	14.470	13.487	15.174	15.463	24.845	18.622	24.506		0.979

*Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-safety-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

†*LSD* for location means = 0.979 t/ha at $p = 0.10$.

‡*CV* = coefficient of variation.

Table 6. Preharvest and harvest yields of theoretical recoverable 96° sugar (in kilograms per metric ton of cane—KS/T) from plant cane on Lauderhill muck, Torry muck, and Malabar sand

Clone	Preharvest yield by soil type, farm, and sampling date				Harvest yield by soil type, farm, and sampling date			
	Lauderhill muck	Torry muck	Malabar sand		Lauderhill muck	Torry muck	Malabar sand	
	Okeelanta 10/26/95	Eastgate 10/26/95	Hilliard 10/24/95	Mean yield, all farms	Okeelanta 1/10/96	Eastgate 3/5/96	Hilliard 11/30/95	Mean yield, all farms
CP 90–1535	128.6	116.3	127.7	124.2	133.6	121.1	134.1	129.6
CP 90–1464	126.9	113.0	121.3	120.4	122.9	127.6	137.1	129.2
CP 90–1113	127.0	101.7	120.1	116.3	128.1	118.3	135.6	127.3
CP 90–1436	130.8	112.6	118.3	120.6	129.9	119.6	130.3	126.6
CP 90–1151	121.9	105.2	120.6	115.9	126.9	122.1	127.9	125.6
CP 90–1424	127.8	105.9	130.4	105.9	121.4	118.0	137.0	125.5
CP 90–1204	125.6	116.9	114.0	118.9	125.1	115.5	124.8	121.8
CP 90–1510	113.9	105.7	117.7	112.4	119.4	117.0	127.8	121.4
CP 70–1133	117.2	93.4	119.9	110.2	119.2	114.9	124.0	119.4
CP 90–1549	107.9	96.9	120.6	108.5	119.2	116.6	119.6	118.5
CP 90–1222	98.9	84.0	120.4	101.1	118.5	107.8	125.5	117.3
CP 90–1428	122.5	103.7		113.1	115.3	118.0		116.6
CP 90–1030			129.6				132.2	
Mean	120.8	104.6	121.7	115.7	123.3	118.0	129.7	123.7
LSD(p =0.1)*	16.7	25.3	15.1	9.0	1.9	3.1	3.1	2.8
CV(%)†	7.7	13.5	6.4	9.3	3.6	5.8	6.3	5.3

**LSD*'s for location means at $p = 0.10$ are 4.4 kg of sugar per metric ton of cane for the preharvest yields and 2.1 kg of sugar per metric ton of cane for the harvest samples.

†*CV* = coefficient of variation.

Table 7. Yields of cane and of theoretical recoverable 96° sugar (in metric tons per hectare—TC/H and TS/H) from plant cane on Lauderhill muck, Torry muck, and Pompano fine sand

	Cane yield by soil type, farm, and sampling date				Sugar yield by soil type, farm, and sampling date			
	Lauderhill muck	Torry muck	Malabar sand		Lauderhill muck	Torry muck	Malabar sand	
Clone	Okeelanta 1/10/96	Eastgate 3/5/96	Hilliard 1/30/95	Mean yield, all farms	Okeelanta 1/10/96	Eastgate 3/5/96	Hilliard 11/30/95	Mean yield, all farms
CP 90–1464	188.19	96.10	81.04	121.78	24.023	11.837	11.081	15.647
CP 90–1436	175.08	106.00	82.08	121.06	20.984	13.850	10.681	15.172
CP 90–1151	180.03	87.51	83.45	117.00	21.897	11.100	10.674	14.557
CP 70–1133	204.38	85.67	75.70	121.91	23.617	10.218	9.421	14.419
CP 90–1510	207.02	55.15	95.29	119.15	24.157	6.590	12.176	14.308
CP 90–1535	159.60	99.07	70.64	109.77	19.301	13.255	9.502	14.019
CP 90–1549	179.23	82.19	87.09	116.17	20.931	9.781	10.485	13.732
CP 90–1204	180.02	81.67	78.45	113.38	20.875	10.203	9.804	13.627
CP 90–1424	171.74	79.62	79.27	110.21	20.218	9.699	10.848	13.588
CP 90–1222	195.19	78.73	73.38	115.77	20.995	9.354	9.251	13.200
CP 90–1113	169.05	59.24	66.87	98.38	20.050	7.584	9.053	12.229
CP 90–1428	240.09	73.60		156.84	28.545	8.448		18.497
CP 90–1030			66.20				8.758	
Mean	187.46	82.04	78.29	115.93	22.133	10.160	10.145	14.146
LSD(p =0.1)*	19.13	7.31	7.31	24.26	2.732	0.964	1.064	3.043
CV(%)†	15.02	13.11	13.75	15.94	18.163	13.964	15.436	18.535

**LSD* for location means of cane yield = 9.89 t/ha and of sugar yield = 1.206 t/ha.

†*CV* = coefficient of variation.

Table 8. Yields of cane (in metric tons per hectare—TC/H) from first-ratoon cane on Dania muck, Lauderhill muck, Pahokee muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Dania muck	Lauderhill muck			Pahokee muck		Pompano fine sand		
Clone	Knight 12/18/95	Wedg-worth 12/19/95	Okeelanta 12/20/95	New Hope 1/3/96	Duda 11/13/95	S. Fla. Ind. 12/5/95	Lykes Bros. 11/15/95	Stability-safety index*	Mean yield, all farms
CP 90–1436	96.16	148.12	102.82	117.71	156.76	113.19	83.77	–28.05	116.93
CP 90–1464	104.45	167.38	104.21	101.85	162.76	83.71	54.76	–45.61	111.30
CP 90–1204	89.60	149.94	90.24	85.80	176.81	100.01	66.98	–44.73	108.48
CP 90–1222	91.34	154.31	98.19	89.27	151.30	108.16	59.29	–37.37	107.41
CP 70–1133	88.43	154.21	84.15	98.21	146.50	106.49	66.98	–39.32	106.42
CP 90–1549	75.15	129.15	89.98	87.25	150.91	95.43	73.90	–46.69	100.25
CP 90–1151	66.86	133.89	82.48	78.27	133.98	82.39	53.54	–51.67	90.20
CP 90–1113	72.94	154.52	86.45	73.18	135.42	60.09	44.57	–69.31	89.60
CP 90–1424	84.65	112.91	82.20	83.78	129.69	82.18	42.66	–59.20	88.30
CP 90–1535	48.84	97.52	82.33	96.10	133.19	85.14	65.70	–81.59	86.98
CP 90–1510	78.50	119.14	90.12	80.94	106.71	76.55	46.96	–67.93	85.56
CP 90–1428	89.06	138.35	93.84	88.65	140.67	108.43		–45.49	109.83
CP 90–1030							49.82		
Mean	82.17	138.29	90.58	90.09	143.73	91.81	59.08	–51.41	99.39
LSD(p=0.1)†	14.89	12.85	11.74	8.92	27.92	10.25	9.75		10.06
CV(%)‡	13.02	12.96	10.92	10.56	11.15	14.22	18.02		13.15

*Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter.

†*LSD* for location means = 8.82 t/ha at $p = 0.10$.

‡*CV* = coefficient of variation.

Table 9. Theoretical recoverable yields of 96° sugar (in kilograms per metric ton of cane—KS/T) from first-ratoon cane on Dania muck, Lauderhill muck, Pahokee muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Dania muck	Lauderhill muck			Pahokee muck		Pompano fine sand		
Clone	Knight 12/18/95	Wedg-worth 12/19/95	Okeelanta 12/20/95	New Hope 1/3/96	Duda 11/13/95	S. Fla. Ind. 12/5/95	Lykes Bros. 11/15/95	Stability-safety index*	Mean yield, all farms
CP 90–1535	128.7	116.1	132.3	129.8	120.8	135.1	134.7	87.3	128.2
CP 90–1113	123.7	114.0	132.4	124.7	116.9	129.4	140.3	81.5	125.9
CP 90–1151	124.1	112.3	127.8	126.0	113.8	127.9	126.9	81.2	122.7
CP 90–1436	121.0	102.3	130.7	130.5	111.0	134.2	128.9	78.4	122.6
CP 90–1204	120.7	109.1	130.4	126.7	109.8	125.7	123.2	77.9	120.8
CP 90–1510	120.6	98.3	124.8	125.1	114.7	129.2	125.6	76.3	119.7
CP 90–1424	115.8	103.0	123.3	125.5	101.6	128.2	129.5	73.7	118.1
CP 70–1133	118.2	99.2	126.0	125.3	107.1	121.3	125.2	76.2	117.5
CP 90–1549	114.9	112.0	121.0	117.2	113.9	120.9	114.4	63.8	116.3
CP 90–1222	115.9	92.4	117.3	118.5	105.3	123.9	127.6	70.0	114.4
CP 90–1464	119.1	107.5	110.8	124.7	109.4	104.5	124.4	55.0	114.3
CP 90–1428	115.7	91.1	123.7	121.8	103.3	123.9		66.6	113.2
CP 90–1030							133.4		
Mean	119.9	104.8	125.0	124.6	110.6	125.3	127.8	74.0	119.7
LSD(p=0.1)†	5.1	5.6	11.8	4.0	5.2	4.7	6.8		4.4
CV(%)‡	4.3	5.2	11.2	4.9	4.5	4.5	6.1		6.2

*Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter.

†*LSD* for location means = 4.0 kg of sugar per metric ton of cane at $p = 0.10$.

‡*CV* = coefficient of variation.

Table 10. Theoretical recoverable yields of 96° sugar (in metric tons per hectare—TS/H) from first-ratoon cane on Dania muck, Lauderhill muck, Pahokee muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Dania muck	Lauderhill muck			Pahokee muck		Pompano fine sand		
Clone	Knight 12/18/95	Wedg-worth 12/19/95	Okeelanta 12/20/95	New Hope 1/3/96	Duda 11/13/95	S. Fla. Ind. 12/5/95	Lykes Bros. 11/15/95	Stability-safety index*	Mean yield, all farms
CP 90–1436	11.625	15.230	13.449	15.351	17.458	15.234	10.758	–0.024	14.158
CP 90–1204	10.816	16.390	11.787	10.880	19.423	12.519	8.282	–1.289	12.871
CP 90–1464	12.373	18.004	11.806	12.713	17.719	8.750	6.786	–4.065	12.593
CP 70–1133	10.385	15.465	10.591	12.291	15.629	12.948	8.399	–1.039	12.244
CP 90–1222	10.545	14.317	11.498	10.568	15.906	13.436	7.568	–1.403	11.977
CP 90–1549	8.627	14.546	10.887	10.242	17.234	11.515	8.396	–1.894	11.635
CP 90–1535	6.334	11.370	10.893	12.432	16.056	11.569	8.928	–5.057	11.083
CP 90–1113	9.046	17.830	11.503	9.082	15.838	7.786	6.262	–5.849	11.050
CP 90–1151	8.311	15.034	10.519	9.856	15.268	10.536	6.787	–2.217	10.902
CP 90–1424	9.785	11.639	10.136	10.514	13.213	10.555	5.528	–3.590	10.196
CP 90–1510	9.456	11.782	11.243	10.125	12.286	9.878	5.957	–4.096	10.104
CP 90–1428	10.287	12.713	11.619	10.813	14.576	13.444		–2.776	12.242
CP 90–1030							6.666		
Mean	9.799	14.527	11.328	11.239	15.884	11.514	7.526	–2.775	11.688
LSD(p =0.1)†	1.843	1.491	2.064	1.182	2.989	1.466	1.183		1.294
CV(%)‡	12.027	15.440	16.552	11.077	13.112	16.120	19.501		14.967

*Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter.

†*LSD* for location means = 1.243 t/ha at $p = 0.10$.

‡*CV* = coefficient of variation.

Table 11. Yields of cane and sugar from the first-ratoon harvest of successively planted plant cane on Lauderhill muck planted at Okeelanta Corporation (sampled on January 4, 1996)

Clone	Yield of cane— TC/H (metric tons per hectare)	Yield of 96° sugar— KS/T (kg per metric ton of cane)	Yield of 96° sugar— TS/H (metric tons per hectare)
CP 89–2143	87.55	137.7	12.053
CP 89–2377	95.66	116.3	11.221
CP 89–1717	77.82	135.3	10.552
CP 89–1325	77.46	125.2	9.746
CP 89–1632	65.62	130.5	8.559
CP 89–1331	62.38	137.2	8.535
CP 89–1756	68.12	120.9	8.193
CP 89–2376	57.39	130.6	7.421
CP 89–1268	52.28	128.4	6.693
CP 89–1643	58.13	104.4	6.595
CP 70–1133	46.81	115.9	5.410
CP 89–1945	42.29	122.0	5.165
Mean	65.96	125.4	8.345
LSD(p =0.1)	12.25	15.3	1.773
CV(%)*	19.65	15.3	22.805

**CV* = coefficient of variation.

Table 12. Yields of cane (in metric tons per hectare—TC/H) from second-ratoon cane on Lauderhill, Pahokee, Terra Ceia, and Torry mucks

	Mean yield by soil type, farm, and sampling date								
	Lauderhill muck			Pahokee muck		Terra Ceia muck	Torry muck		
Clone	Okeelanta 10/12/95	Knight 10/26/95	Wedg-worth 1/21/96	S. Fla. Ind. 11/2/95	Duda 1/17/96	New Hope 11/8/95	Eastgate 11/6/95	Stability-safety index*	Mean yield, all farms
CP 89–1325	83.33	92.11	128.58	54.09	114.30	87.38	102.04	–62.83	94.54
CP 89–2376	79.38	101.40	131.43	63.58	97.53	99.15	86.81	–79.75	94.18
CP 89–1717	70.76	97.11	135.15	56.41	104.29	81.42	106.77	–69.20	93.13
CP 89–2143	88.48	103.47	125.87	50.94	108.67	86.22	83.84	–72.09	92.50
CP 89–2377	89.23	103.43	118.74	27.58	105.00	85.62	98.98	–77.96	89.80
CP 70–1133	79.06	87.65	120.94	41.09	86.58	71.46	97.94	–74.81	83.53
CP 89–1268	73.65	86.78	111.56	48.10	94.93	68.62	98.01	–73.91	83.09
CP 89–1331	75.68	90.52	106.41	37.48	95.28	73.29	77.77	–80.05	79.49
CP 89–1756	66.88	80.56	106.20	24.35	89.47	69.54	88.71	–80.61	75.10
CP 89–1945	54.38	69.06	102.27	24.69	87.49	65.76	102.57	–97.26	72.32
CP 89–1632	61.18	69.28	88.44	35.67	82.91	55.20	87.13	–94.93	68.54
CP 89–1643	55.85	90.58	99.50	14.81	79.54	43.95	82.51	102.88	66.68
Mean	73.15	89.33	114.59	39.90	95.50	73.97	92.76	–80.52	82.74
LSD(p =0.1)†	10.43	11.28	10.52	11.26	13.13	11.22	14.00		7.37
CV(%)‡	17.57	14.50	11.03	26.13	16.39	20.71	15.50		16.27

*Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter.

†*LSD* for location means = 6.05 t/ha at $p = 0.10$.

‡*CV* = coefficient of variation.

Table 13. Theoretical recoverable yields of 96° sugar (in kilograms per metric ton of cane—KS/T) from second-ratoon cane on Lauderhill, Pahokee, Terra Ceia, and Torry mucks

	Mean yield by soil type, farm, and sampling date								
	Lauderhill muck			Pahokee muck		Terra Ceia muck	Torry muck		
Clone	Okeelanta 10/12/95	Knight 10/26/95	Wedg-worth 1/21/96	S. Fla. Ind. 11/2/95	Duda 1/17/96	New Hope 11/8/95	Eastgate 11/6/95	Stability-safety index*	Mean yield, all farms
CP 89–2143	124.0	123.2	115.2	154.4	134.2	145.6	116.9	15.3	130.5
CP 89–1331	121.5	112.0	110.9	152.0	125.2	134.8	118.3	14.9	124.9
CP 89–1632	124.2	107.9	101.9	155.3	121.2	141.0	113.4	14.6	123.5
CP 89–1717	126.3	103.8	97.3	148.3	120.6	141.8	115.2	12.3	121.9
CP 89–1945	121.1	108.9	98.9	141.6	117.4	138.4	117.8	10.4	120.6
CP 89–1756	126.1	90.4	108.8	149.8	120.4	133.1	115.0	3.4	120.5
CP 89–2376	115.0	95.3	97.9	153.1	124.8	137.8	110.5	5.1	119.2
CP 89–1325	122.3	90.2	102.5	145.4	119.2	130.9	117.7	3.8	118.3
CP 89–1268	124.1	103.3	99.5	140.3	112.6	132.2	116.1	7.8	118.3
CP 70–1133	117.7	102.9	98.0	143.5	116.3	129.1	109.6	9.3	116.7
CP 89–1643	117.0	105.0	102.7	131.0	105.0	134.6	106.4	–3.3	114.5
CP 89–2377	108.1	99.8	89.6	144.5	115.0	133.4	106.1	2.4	113.8
Mean	120.6	103.6	101.9	146.6	119.3	136.0	113.6	8.0	120.0
LSD(p =0.1)†	9.9	17.8	8.0	7.0	5.3	6.1	8.3		4.6
CV(%)‡	7.7	15.6	9.0	6.2	5.9	6.1	5.1		8.0

*Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter.

†*LSD* for location means = 2.9 kg of sugar per metric ton of cane at $p = 0.10$.

‡*CV* = coefficient of variation.

Table 14. Theoretical recoverable yields of 96° sugar (in metric tons per hectare—TS/H) from second-ratoon cane on Lauderhill, Pahokee, Terra Ceia, and Torry mucks

	Mean yield by soil type, farm, and sampling date								
	Lauderhill muck			Pahokee muck		Terra Ceia muck	Torry muck		
Clone	Okeelanta 10/12/95	Knight 10/26/95	Wedgworth 1/21/96	S. Fla. Ind. 11/2/95	Duda 1/17/96	New Hope 11/8/95	Eastgate 11/6/95	Stability-safety index*	Mean yield, all farms
CP 89–2143	11.022	12.725	14.521	7.865	14.600	12.509	9.923	–4.093	11.881
CP 89–1717	8.952	10.251	13.184	8.343	12.581	11.546	12.399	–2.567	11.037
CP 89–2376	9.151	9.596	12.975	9.692	12.175	13.615	9.627	–6.885	10.976
CP 89–1325	10.220	8.195	13.209	7.852	13.622	11.388	12.048	–3.801	10.933
CP 89–2377	9.672	10.200	10.653	3.993	12.106	11.457	10.514	–5.475	9.799
CP 89–1331	9.083	10.173	11.789	5.684	11.957	9.818	9.241	–3.928	9.678
CP 89–1268	9.127	8.810	11.146	6.749	10.665	9.115	11.365	–4.137	9.568
CP 70–1133	9.255	9.044	11.839	5.935	10.086	9.226	10.747	–3.982	9.447
CP 89–1756	8.428	7.253	11.537	3.647	10.800	9.271	10.229	–5.224	8.738
CP 89–1945	6.589	7.560	10.173	3.507	10.301	9.049	12.078	–7.217	8.465
CP 89–1632	7.548	7.624	8.973	5.532	10.059	7.758	9.932	–5.763	8.204
CP 89–1643	6.526	9.506	10.296	1.933	8.605	5.913	8.807	–9.387	7.369
Mean	8.798	9.245	11.691	5.894	11.463	10.055	10.576	–5.205	9.675
LSD(p=0.1)†	1.435	1.885	1.667	1.672	1.737	1.630	2.036		1.042
CV(%)‡	19.273	24.098	16.855	33.517	17.908	19.155	22.754		19.115

*Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter.

†*LSD* for location means = 0.812 t/ha at $p = 0.10$.

‡*CV* = coefficient of variation.

Table 15. Yields of cane and sugar from second-ratoon cane on Malabar sand and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Yields of cane			Yields of sugar					
	TC/H (metric tons per hectare)			KS/T (kg sugar per metric ton of cane)			TS/H (metric tons per hectare)		
Clone	Malabar sand Hilliard 11/1/95	Pompano fine sand Lykes 11/15/95	Mean yield, both farms	Malabar sand Hilliard 11/1/95	Pompano fine sand Lykes 11/15/95	Mean yield, both farms	Malabar sand 11/1/95	Pompano fine sand 11/15/95	Mean yield, both farms
CP 89–2143	75.43	51.37	63.40	136.0	140.7	138.4	10.315	7.245	8.780
CP 70–1133	84.28	51.46	67.87	125.3	131.7	128.5	10.547	6.791	8.669
CP 89–1325	80.45	46.68	63.57	127.9	137.3	132.6	10.303	6.415	8.359
CP 89–2376	76.87	47.78	62.33	127.7	137.3	132.5	9.883	6.547	8.215
CP 89–2377	66.62	56.05	61.33	116.0	124.7	120.3	7.720	6.957	7.339
CP 89–1717	63.16	45.91	54.53	131.9	132.8	132.4	8.336	6.103	7.220
CP 89–1945	61.16	33.40	47.28	132.6	137.2	134.9	8.121	4.535	6.328
CP 89–1643	45.96	39.17	42.57	124.4	127.6	126.0	5.753	4.973	5.363
CP 89–1331	41.28	39.56	40.42	116.2	129.5	122.8	5.536	5.143	5.340
CP 89–1632	40.46	37.90	39.18	132.0	139.3	135.6	5.343	5.268	5.306
CP 89–1509	61.74			128.6			7.882		
CP 89–1547	73.22			121.6			8.895		
CP 89–1268		49.39			135.7			6.699	
CP 89–1756		52.79			129.8			6.879	
Mean	64.22	45.95	55.09	126.7	133.6	130.2	8.220	6.130	7.175
LSD(p =0.1)*	11.27	10.31	16.19	14.3	9.0	4.7	1.558	1.459	1.985
CV(%)†	21.69	18.46	20.20	11.2	6.1	9.6	21.978	21.323	21.650

**LSD's* for location means at $p = 0.10$ are 9.80 metric tons of cane per ha, 5.9 kg sugar per metric ton of cane, and 1.292 metric tons of sugar per ha.

†*CV* = coefficient of variation.

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Table 16. Dates of stalk counts at 10 plant-cane, 8 first-ratoon, and 9 second-ratoon experiments

Location	Crop		
	Plant cane	First ratoon	Second ratoon
Duda	8/29/95	9/1/95	8/21/95
Eastgate	6/12/95	—	8/30/95
Hilliard	9/26/95	—	9/22/95
Knight	6/27/95	9/11/95	9/13/95
Lykes	10/2/95	10/3/95	9/27/95
New Hope	6/14/95	7/19/95	7/21/95
Okeelanta	6/28/95	6/30/95	9/19/95
Okeelanta (successive)	7/31/95	7/11/95	—
South Florida Industries	8/11/95	9/18/95	9/14/95
Wedgworth	6/26/95	9/7/95	9/6/95

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